THE AGRICULTURAL NEWS LETTER

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THIS IS THE SEASON OF THE YEAR when insect control and the treatment of seeds is of paramount importance to the grower. A great amount of study and research on the effects of new insecticides and products for the treatment of seeds has been made and is being made by the United States Department of Agriculture, college experiment stations, commercial manufacturing companies and individual growers.

The new products manufactured by the du Pont Company and its affiliated companies have been widely studied and this issue contains the results of some of these studies and tests. These results show how certain insects have been successfully controlled with the new products.

Those who have similar problems or wish further information may write either to this Company or to the Experiment Station, or the grower mentioned. It is hoped that the presentation of these successful results will be of help to those farmers who have problems in insect control similar to the ones referred to.

This issue contains:

What the University of Alberta, Canada, found in a study of the relative value of chemical dusts for the treatment of seed grain.

Tests against the Mexican bean bettle by the Massachusetts Agricultural Experiment Station.

How the onion thrip has been controlled in the Gulf States.

How the Cucumber fruit worm has been controlled in the Louisiana Area.

How the Connecticut Growers controlled the Tobacco Flea beetle.

A new development in sulphur as an insecticide.

Some experiments in the control of blister beetles and eggplant flea beetles.

How apple maggot is controlled in the New England States.

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RELATIVE VALUE OF CHEMICAL DUSTS AND FORMALDEHYDE FOR THE TREATMENT OF SEED GRAIN

An important bulletin just issued by the University of Alberta and known as Extension Leaflet No. 13, discusses the relative value of chemical dusts and formaldehyde for the treatment of seed grain. The leaflet is signed by A. W. Henry, Department of Field Crops.

It states as follows:

"The appearance of new preparations for seed treatment on the market has naturally raised the question as to their relative merits, especially in comparison with formaldehyde, which has long been the most commonly used chemical for the treatment of seed grain in Western Canada.

Prevention of Smut

"The formaldehyde treatment is used primarily for the control of covered smut of wheat (bunt or stinking smut), the oat smuts and the covered smut of barley. It will not control the loose smuts of wheat and barley. How do the new dust preparations compare with formaldehyde as to effectiveness in the prevention of these smut diseases? This may be judged for wheat from the results of our 1933 tests at Edmonton, given in the table.

Results of treating a heavily smutted sample of spring wheat with different chemicals at the University of Alberta in 1933.

Treatment	Form	Concentration	Rate per bushel	Percent of smutted heads	Percent Seedling Emergence	Yield in bushels per acre
None (check)	.....	.....	.....	35.1	69.6	11.4
Formaldehyde	Liquid	1-320	.....	0.1	52.4	22.3
New Improved Ceresan	Dust	5%	½ oz.	0.2	72.0	28.3
Copper Chloride	Dust	48%	3 "	1.1	65.6	28.9
Copper Carbonate	Dust	50%	3 "	2.1	65.7	28.3

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"The sample of Red Bobs wheat used in these tests was heavily smutted the crop from untreated seed showing 35 percent of the heads diseased. Treatment with formaldehyde gave almost complete control, reducing infection to an average of 0.1 percent of infected heads. Of the three dusts New Improved Ceresan gave the best control, being almost as effective as formaldehyde. Each dust was applied at different rates, but only the most effective rate for each is given. It will be noted that New Improved Ceresan was used at only one half ounce per bushel, while the other two dusts were used at three ounces per bushel. Even at this low rate it gave considerably better control of this smut than either copper chloride or copper carbonate. It has also given efficient control of oat smuts and covered smut of barley in our tests to date."

FURTHER DISCUSSION OF THE VALUE OF CHEMICAL DUSTS FOR THE TREATMENT OF SEED GRAINS

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Gilbert F. Miles, director of research for the Bayer-Semesan Company, formerly Extension Pathologist for the Pennsylvania State College, is now in the West making field tests of the new dust disinfectants.

He comments on the recent findings of the University of Alberta as mentioned on the preceeding page and also gives some unofficial results from trials in seven Kansas counties.

He says:

"Grain growers of the United States and Canada will be interested in a recent report (Extension Leaflet 13) issued by the University of Alberta, Edmonton, Canada, concerning ethyl mercury phosphate for the treatment of seed grains. According to field experiments and observations by the University, this new mercurial is more effective in the control of stinking smut of wheat than other dust treatments commonly used.

"Comparing it with the soak method still used in some sections, the report points out that the ethyl mercury phosphate dust gives excellent control of stinking smut of wheat without involving injury to the seed and decreases in yield which so frequently result from the wet method.

"Of particular interest to growers who are watching their grain production costs is the fact that the new disinfectant, used at the recommended rate of only one-half ounce per bushel of seed wheat, oats, or barley, costs considerably less than any other dust treatment. It is also more easily and more quickly applied.

"Unofficial reports from trials in seven Kansas counties confirm earlier results from other sections as to the advantages of the new dust disinfectant. According to yield figures just received from carefully conducted tests, ethyl mercury phosphate increased the yield of wheat from clean (non-smutty) seed by an average of 1.1 bushels per acre or nearly six percent as compared with the yields from similar seed untreated. Counties in which tests were conducted include Morris, Dickinson, Riley, Lyon, Franklin, Douglas and Shawnee.

"These increases in yield following treatment of non-smutty seed are said to result from the control of other fungous parasites on the seed and in the soil which cause seed rotting, root rots, and seedling blights. Ethyl mercury phosphate appears to give much better control of these very common troubles than the older treatments, and as a result increases of five to ten percent in the yield of wheat, oats and barley frequently follow its use.

IMPORTANT POINTS IN THE STUDY OF MATERIALS WHICH PROMISE TO BE OF VALUE IN INSECT CONTROL

Bulletin No. 305 of the Massachusetts Agricultural Experiment Station, March 1934, Annual Report, for the fiscal year ending November 30, 1933, contains the results of certain studies in regard to the compound known as Dutox, manufactured by the Grasselli Chemical Company of Cleveland, Ohio.

On pages 28 and 29 of this report, A. I. Bourne in charge of the Department of Entomology says as follows:

"In tests against the Mexican Bean Beetle, Dutox, a commercial fluosilicate compound, was applied as a dust and used in dilutions of one part to two and one to three of hydrated lime. No injury to bean foliage resulted from either application. As the results of previous tests, no injury would be expected from this material at these dilutions except under conditions of very high temperature humidity. The effectiveness of this material compares very favorably with that of magnesium arsenate, the standard treatment, furthermore, re-infestation was very slow following the application of Dutox."

A statement in the above quotation of interest to growers is that, "Re-infestation was very slow following the applications of Dutox."

This would seem to indicate that under normal conditions over a period of a season's growth, less applications of Dutox would be required to control the Mexican bean beetle. Perhaps the residual effects of the fluosilicate compound were effective in these Massachusetts experiments over a greater length of time and therefore made it more difficult for the bean beetle to obtain a new foothold after the initial application of Dutox. ----- THE EDITOR.

ONION THRIP CONTROL IN THE GULF STATES

In the May issue of the Agricultural News Letter announcement was made of a contact insecticide by the Grasselli Chemical Co. This aroused considerable interest. We publish below comments on the use of this new insecticide for onion thrip control in the Gulf States and the proper method of its application. The comments are by W. F. Larrison, for many years a practical grower and now field man for the Grasselli Chemical Co. -- THE EDITOR.

This is one of the worst and most widely distributed insects with which growers have to contend. In the extreme northern states, unless the season is abnormally dry, the thrip is not liable to do serious damage, but is getting to be a menace even there. As more southern areas are reached, the damage becomes greater and in the Gulf States, entire fields are frequently destroyed. In much of the Gulf States territory, many farmers make no attempt to grow onions for family use. Many farmers in Florida have given up all attempts to grow onions, except in a few local sections.

All members of the onion family are subject to infestation. Growers in the Texas Bermuda sections compare onion growing to a game of poker, and while thousands of bushels are grown in that state, a grower frequently loses his entire planting. Where the thrip gets into the seed beds, there has been little hope of saving them.

At whatever state of growth a heavy infestation occurs, all growth ceases and the seedling plants often die. After the plants are set in the permanent field the onion will simply stand making no further growth. If the onion has reached nearly a marketable size, a heavy infestation renders its keeping qualities very poor, causing heavy losses on the road to market.

No satisfactory control has ever been found until in the past year - all the contact sprays proving very inefficient. Texas growers in a few sections have used a very strong kerosene emulsion. The emulsion in many cases, owing to the high strength necessary to get a fair control, often does serious damage to the plant, this being especially true where used on the seed beds. No results whatever can be expected where a dust application of any kind is used. A liquid spray applied directly into the heart of the onion is all that can give any control.

In the past year the Grasselli Chemical Company has developed a new contact spray which shows promise in control of the onion thrip. Field trials in widely separated areas have given practically a perfect control.

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To give results on thrip, it must be used with a spreader. Any of the spreaders now used with the contact sprays on the market can be used with it with perfect safety and a good promise of success.

NOTE:- The trade name of the new material is Loro. The proper method of its application is as follows:

In the Gulf States a kerosene spreader will give best results; will also lower material costs, as the amount of Loro necessary for control can be greatly lowered.

A kerosene spreader for onions, to be used with Loro, should be made thus -

1 - gallon Kerosene
1 - pound Hard Water Soap dissolved in one quart boiling water
8 - ounces borax.

Use one ounce of spreader to each gallon of Loro spray and three pints to fifty gallons.

This spreader should only be used freely in districts where kerosene emulsions have been used on onions previously. In districts where kerosene emulsions have not heretofore been used safely on onions, foliage tests should be made before using in a large way.

HOW THE CUCUMBER FRUIT WORM IS CONTROLLED IN THE FALL GROWING OF CUCUMBERS AND TOMATOES IN THE LOUISIANA AREA

By:- A field man for the Grasselli Chemical Co.

The growing of fall cucumbers is becoming quite a success in the Hammond, La., strawberry section. This section is the famous strawberry area and is roughly embraced in the territory - east to Covington, south to Ponchatoula, west to Dunham Springs, north to Amite, and the 1933 acreage on cucumbers was largely increased over the previous season.

For some years prior to 1931, the growing of fall cucumbers became pretty much of a gamble owing to the cucumber fruit worm. In the fall of that year a number of growers at Ponchatoula tried a barium fluosilicate compound for the control of this worm and met with a remarkable success, reporting 92 to 95 percent of clean fruit. The practice here is to use it in combination with Bordeaux as it is impossible to grow fall cucumbers in Louisiana without using Bordeaux as a blight preventative, the first application being made as soon as rough leaves appear using a Bordeaux of three pounds copper sulfate, four and one half pounds hydrated lime to fifty gallons water, or where unslacked or barrel lime is used three pounds copper sulfate, three pounds unslacked lime. If a prepared Bordeaux powder is used, six pounds are used to fifty gallons water. At the first appearance of the buds, Dutox is added to the above mixture at the rate of two pounds to fifty gallons and continued at intervals of ten days or two weeks until vines begin to bear, when all danger of worms is then past. The Bordeaux treatment is also discontinued, as all blights must be prevented. There is no control once it is allowed to develop. Worm control must also be started in time if a clean fruit is to be expected. The same schedule as followed in Louisiana is appliable to all of the Gulf Coast section, including Florida, South Georgia, Alabama, Mississippi and Texas where the striped cucumber beetle is a menace. The material in dust form, applied around the plants at their first appearance has given a perfect control. Some growers use it straight, others mix it 50-50 with flour.

In the growing of tomatoes in the same section, fall planted, a Bordeaux is also used for blight preventative, using four pounds copper sulphate, six pounds hydrated lime to fifty gallons of water, or four pounds of copper sulphate, four pounds unslacked lime to fifty gallons of water, or eight pounds prepared Bordeaux powder to fifty gallons of water.

At the first appearance of the fruit worm, two pounds of the barium fluosilicate are added to the above mixture of fifty gallons or it can be used in water alone, two pounds to fifty gallons for worm control, continued at intervals of two weeks. This has given a fine control among the Louisiana and also in all other areas where the tomato fruit worm has proven a menace.

CONNECTICUT EXPERIMENTER FINDS A CONTROL FOR POTATO FLEA BEETLE IN TOBACCO

On the sun and shade grown tobacco crop in Connecticut, the potato flea beetle is a very destructive pest at times. Connecticut investigators have studied control methods for this insect and after three years work, according to Connecticut Bulletin 350, it was concluded that barium fluosilicate was a very satisfactory control material.

This chemical dusted at the rate of four to five pounds to the acre resulted in good control, and four dustings at weekly intervals left no visible residue.

According to this bulletin several Connecticut growers used this fluorine compound during 1932 with satisfactory results. One grower diluted it with tobacco dust applying three pounds of active material per acre, and reported very good control with a single application.

This material has been established as the standard control for tobacco flea beetle in the Quincy, Florida, areas devoted to production of shade grown tobacco. Federal investigators at that point found that barium fluosilicate diluted with tobacco dust was a most effective and practical control for this destructive beetle.

It is now established in both areas as the standard control for flea beetles on tobacco.

A NEW DEVELOPMENT IN SULPHUR AS AN INSECTICIDE

Sulphur has been used as a fungicide for many years, and is the most effective remedy available for certain fungous diseases. It has long been recognized that some forms of sulphur are more effective as fungicides than others, and considerable research work has been done to determine the toxic constituent of the different forms of sulphur. It is now almost universally agreed that the toxic substance of sulphur is liberated more readily when the sulphur is in a finely divided condition.

There are many applications for sulphur as a spray, but unfortunately finely divided sulphur does not mix readily with water and does not remain in suspension well, which has greatly hindered its use as a spray. With this in mind the Research Department of the Grasselli Chemical Company has developed extremely finely divided sulphur in a form which mixes almost instantly with water and remains in suspension very well.

It is used for post blossom applications on apples to control scab; on peaches, plums and cherries to control brown rot. On peas and beans to control mildew; on roses to control black spot and mildew and on carnations and many other flowers to control rust and mildew.

It can be applied as a spray, or in dust form.

CONTROL OF BLISTER BEETLES AND THE EGGPLANT FLEA BEETLE

It may be of interest to the readers of the Agricultural News Letter to know of the experience of Mr. V. R. Diamond in and around Lafayette, Ind., who found that the barium fluosilicate dust, sold under the trade name of Dutox, was a control for blister beetles attacking the eggplant crop, potatoes and zinnias, and the eggplant flea beetle.

In the matter of blister beetles attacking the eggplant crop, the report of Mr. Diamond's experiments on the use of a dilute barium fluosilicate dust on this insect states that one application of a commercial 80 percent active barium fluosilicate product diluted four times with a clay (flour or hydrated lime may be used to replace the clay) was made to a commercial crop of eggplant during July in Indiana. Close observation of the field the following day showed large numbers of dead beetles on the ground under the dusted plants. The attack was definitely stopped.

Among Mr. Diamond's experiments was one relating to an instance occurring in Indiana during July 1933 in which it was reported that blister beetles attacked a commercial planting of potatoes. One application of a commercial 80 per cent active barium fluosilicate dust diluted four times with clay (flour or hydrated lime may replace the clay) was made in July. Observation on the dusted field the next day indicated one hundred per cent control. An un-dusted field nearby was being severely damaged by feeding activities of the beetles. Numerous dead beetles were found in the dusted field.

Experiments by Mr. Diamond were also had on the eggplant flea beetle. It will be remembered that heavy infestation of eggplant flea beetle occurred during 1933 in certain mid-western areas. The eggplant flea beetle, of course, is very destructive at times. It severely injures foliage by its feeding activities which are always characterized by small "shot hole" effects in the leaves.

The Indiana experiment reported the results of seven tests conducted during July 1933 on commercial plantings. The results indicated that the commercial 80 per cent active barium fluosilicate applied as a dilute dust (one part barium fluosilicate to five parts of clay or hydrated lime) was a definite control for this beetle and was superior to copper-lime dust or lead arsenate. Apparently copper-lime dust and the lead arsenate were repellent to the beetles while barium fluosilicate killed a high percentage of the beetles.

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A summary of the experimenter's results indicates that the 80 per cent active barium fluosilicate compound diluted five times with clay (hydrated lime may be used to replace the clay) gave from 97 per cent to 99 per cent control in the plots. The average per cent control for the seven experiments with this mixture was 95.5 per cent. No injury to plants occurred at any time. The barium fluosilicate (80 per cent active) even when diluted ten times gave a 90 per cent average control for all experiments against 87 per cent for copper-lime dust and 86.6 per cent for lead arsenate.

The experiments of Mr. Diamond also covered the damage blister beetles did to floral crops and certain vegetable crops. A report of his experiments state that a particularly destructive infestation of blister beetles occurred on a commercial crop of zinnias during July 1933. One application of a commercial 80 per cent active barium fluosilicate dust diluted with four parts of clay (flour may be used instead of clay) was applied to the zinnias. An examination twenty-four hours later showed that this dust had given one hundred per cent control and a large number of dead beetles were found on the ground in the zinnia blocks. No injury whatever occurred to the zinnias.

MANGANESE ARSENATE FOR THE CONTROL OF APPLE MAGGOT IN NEW ENGLAND STATES

The control of apple maggot is conceded to be the major insect control problem in most apple growing areas in New England and northern New York State.

Reports have been received from authoritative experimenters which indicate from preliminary trials in 1933 that manganese arsenate is the equal of lead arsenate as a control of apple maggot. This ability of manganese arsenate, if duplicated in future trials now being planned for the material, will establish it as an important insecticide in New England, Northern New York State and possibly Wisconsin. Manganese arsenate has been sold commercially in other commercial apple growing areas as a replacement of lead arsenate in those codling moth control sprays which follow the calyx spray. Reports from dependable sources state that approximately 400,000 pounds of manganese arsenate were sold during 1933.

The use of manganese arsenate on apples in place of lead arsenate in all cover sprays practically eliminates the necessity of cleaning fruit of any spray residues other than arsenical residues. There is no Federal tolerance on manganese residues.

Manganese arsenate may also be said to have possibilities as a plant stimulant. Manganese in itself is known to be an essential plant food element which is totally lacking or unavailable at times in certain soils. Insofar as apples are concerned, one experimenter on the Pacific Coast reported that Gravenstein apples sprayed with manganese arsenate developed a richer more desirable color than those sprayed with standard materials.

The manufacturers of manganese do not claim that the availability to plants of manganese in manganese arsenate is definitely established at this time. Additional research on that phase of manganese arsenate is being carried out.